FAMILY OF CURVES – ONE-POINT METHOD FOP FOR AASHTO T 272

Scope

This procedure provides for a rapid determination of the maximum density and optimum moisture content of a soil sample utilizing a family of curves and a one-point determination in accordance with AASHTO T 272. This procedure is related to AASHTO T 99, and AASHTO T 180.

One-point determinations are made by compacting the soil in a mold of a given size with a specified rammer dropped from a specified height. Four alternate methods – A, B, C, D – are used and correspond to the methods described in AASHTO T 99 or T 180. The method used in AASHTO T 272 must match the method used in AASHTO T 99 or T 180.

Apparatus

See the FOP for AASHTO T 99, and T 180.

Sample

See the FOP for AASHTO T 99, and T 180.

Procedure

See the FOP for AASHTO T 99, and T 180.

Calculations

See the FOP for AASHTO T 99, and T 180.

Maximum Dry Density and Optimum Moisture Content Determination

1. If the moisture-density one-point falls on one of the curves in the family of curves, the maximum dry density and optimum moisture content defined by that curve shall be used.

2. If the moisture-density one-point falls within the family of curves but not on an existing curve, a new curve shall be drawn through the plotted single point parallel and in character with the nearest existing curve in the family of curves. The maximum dry density and optimum moisture content as defined by the new curve shall be used.

   Note 1: If the one-point plotted within or on the family of curves does not fall in the 80 to 100 percent of optimum moisture content, compact another specimen, using the same material, at an adjusted moisture content that will place the one point within this range.

3. If the family of curves is such that the new curve through a one-point is not well defined or is in any way questionable, a full moisture-density relationship shall be made for the soil to correctly define the new curve and verify the applicability of the family of curves.

   Note 2: New curves drawn through plotted single point determinations shall not become a permanent part of the family of curves until verified by a full moisture-density procedure following the FOP for AASHTO T 99.

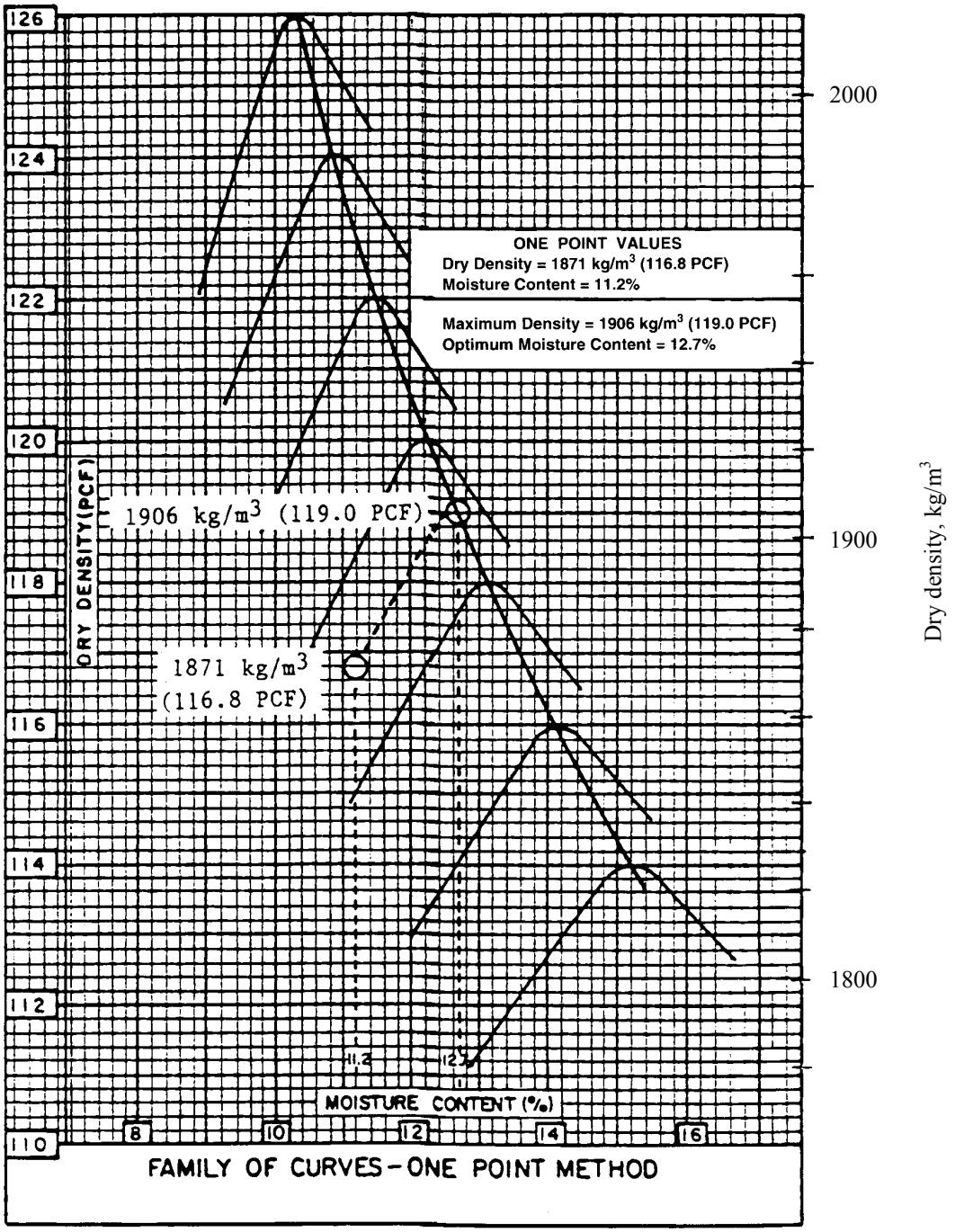

Figure 1. Example of Curves

Example

A moisture-density procedure (AASHTO T 99, or AASHTO T 180) was run. A dry density of 1871 kg/m^3 (116.8 Lb/ft^3) and a corresponding moisture content of 11.2 percent were determined. This point was plotted on Figure 1 between two previously developed curves.

The "dashed" curve beginning at the moisture-density one-point was sketched between the two existing curves. A maximum dry density of 1906 kg/m^3 (119.0 lb/ft^3) and a corresponding optimum moisture content of 12.7 were estimated.

Report

Results shall be reported on standard forms approved by the agency. Report maximum dry density to the closest 1 kg/m^3 (0.1 lb/ft^3) and optimum moisture content to the closest 0.1 percent.